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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/672,889	09/26/2003	James J. Snyder	033806-010	9565
21839	7590	09/14/2006	EXAMINER	
BUCHANAN, INGERSOLL & ROONEY PC POST OFFICE BOX 1404 ALEXANDRIA, VA 22313-1404			LEE, HWA S	
			ART UNIT	PAPER NUMBER
			2877	

DATE MAILED: 09/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/672,889

**Applicant(s)**

SNYDER ET AL.

**Examiner**

Andrew Hwa S. Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 June 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-60 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 20-23, 59 and 60 is/are allowed.
- 6) ☒ Claim(s) 1-19 and 24-58 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. **Claims 1-19 and 35-43** are rejected under 35 U.S.C. 103(a) as being unpatentable over Lam et al (US 6,956,653) in view of Kachanov (US 5,543,916).

4. With regards to **claims 1 and 35**, Lam et al. (Lam hereinafter) show a waveguide interferometer comprising:

an optical waveguide having an input port (e.g. 204) and two output ports, the optical waveguide defining first and second optical paths (218, 220) which operate to direct light from the input port to the first and second output ports, respectively,

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and which have optical lengths which differ by a first optical length difference (e.g. path lengths modulated by 210 and 212), wherein the two output ports are located in a common plane normal to the direction of propagation of the central light rays emitted therefrom and are separated by a separation distance such that light exiting the optical waveguide through the two output ports forms, at an observation plane disposed at a second distance from the two output ports, a fringe pattern whose configuration at the observation plane is a function of the wavelength of the input light beam;

a photo detector (e.g. 236, 436, 536) adapted to generate one or more detection signals in response to said fringe pattern; and

Lam does not expressly show a processor, but it would be inherent a processor is used for analyzing said one or more detection signals.

Lam teaches the interferometer is useful for characterizing input light (column 1, line 11), and gives several different examples in which the interferometer can be used but does not expressly show the interferometer being used to measure the wavelength of the light.

Kachanov shows an interferometer for determining wavelength wherein the interferometer uses two point sources of light similar to Lam's waveguide ends to create an interference pattern. Like Lam, Kachanov shows a detector array to image the interference pattern, but Kachanov shows a use for the interferometer to determine the wavelength of light.

At the time of the invention, one of ordinary skill in the art would have used the interferometer of Lam in order precisely monitor the wavelength of a laser light since Kachanov shows the motivation to measure the wavelength of light.

With regards to **claims 2-4 and 36-41**, both Lam and Kachanov show the determining of fringe position. In addition obtaining the average of measurements is well known in order to obtain a more accurate measurement.

With regards to **claims 5 and 9**, Lam shows the system integrated on a substrate (200, 400, 500) comprising a beamsplitter (216, 516), a phase delay (210, 212, 410, 412) and output ports. Lam teaches a silicon substrate (column 7, line7).

With regards to **claims 6-8, 42, and 43**, Kachanov shows temperature control. Also, Official Notice is taken that heat sinks and temperature controllers in thermal communication with optical devices are well known in order cool or heat optical elements for control or stability and it would have been obvious to one of ordinary skill in the art to use a temperature controller with any element that generates heat such as the laser or computer to cool the laser or computer.

With regards to **claims 10-15**, one of ordinary skill in the art would have optimized for the proper working range of knowing the relationship of the fringe spacing to the wavelength, pathlength difference, point source distance, and the distance to the observation plane as is known by the teaching of Young (Young disclosed by Applicant's disclosure).

With regards to **claim 16**, Lam shows a fiber optic arrangement having in Figure 4, and it would have been well known to also use an arrangement of using a fiber optic beamsplitter.

With regards to **claim 17**, Lam shows the determining of the phase difference between two points in the fringe pattern from said detection signals to determine the wavelength.

With regards to **claims 18 and 19**, obtaining the average of measurements is well known in order to obtain a more accurate measurement.

5. With regards to **claim 24**, Lam shows a waveguide interferometer, the method comprising:

launching the input light beam into a waveguide (e.g. 214);

splitting (216) the input light beam in the waveguide into two light beams;

directing the two light beams through two waveguide paths (218, 220) of different optical

length and having two exit ports that are located in a plane normal to the direction

of propagation of the central light rays exiting from said exit ports;

interfering light exiting said two paths to thereby form a fringe pattern at an observation plane;

detecting the fringe pattern (8a, 8b); and

analyzing the configuration of said detected fringe pattern.

Lam teaches the interferometer is useful for characterizing input light (column 1, line 11), and gives several different examples in which the interferometer can be used but does not expressly show the interferometer being used to measure the wavelength of the light.

Kachanov shows an interferometer for determining wavelength wherein the interferometer uses two point sources of light similar to Lam's waveguide ends to create an interference pattern. Like Lam, Kachanov shows a detector array to image the interference pattern, but Kachanov shows a use for the interferometer to determine the wavelength of light.

At the time of the invention, one of ordinary skill in the art would have used the interferometer of Lam in order precisely monitor the wavelength of a laser light.

With regards to **claim 25**, obtaining the average of measurements is well known in order to obtain a more accurate measurement.

With regards to **claims 26-30**, both Lam and Kachanov shows the determining of fringe position. In addition, obtaining the average of measurements is well known in order to obtain a more accurate measurement.

With regards to **claims 31 and 32**, Kachanov shows temperature control. Also, Official Notice is taken that heat sinks and temperature controllers in thermal communication with optical device is well known in order cool or heat optical elements for control or stability and it would have been obvious to one of ordinary skill in the art to use a temperature controller with any element that generates heat such as the laser or computer to cool the laser or computer.

With regards to **claim 33**, Lam shows a fiber optic arrangement having in Figure 4, and it would have been well known to also use an arrangement of using a fiber optic beamsplitter.

With regards to **claim 34**, Lam shows input light beam is split by means of an integrated optical circuit.

6. **Claims 44-58** are rejected under 35 U.S.C. 103(a) as being unpatentable over Lam and Kachanov as applied to claim 1 above, and further in view of Snyder (US 4,173,442).

With respect to **claim 44**, Lam and Kachanov show all the elements but do not expressly show the process of determining the order number of the light to a reference point and the optical delay.

Snyder shows fringe analysis of determining the order number of the light to a reference point and the optical delay. At the time of the invention, one of ordinary skill in the art would have used the process of Snyder in order obtain a more accurate measurement of the wavelength.

With regards to **claim 45 and 49**, Lam shows the system integrated on a substrate (200, 400, 500) comprising a beamsplitter (216, 516), a phase delay (210, 212, 410, 412) and output ports. Lam teaches a silicon substrate (column 7, line 7).

With regards to **claims 46-48**, Kachanov shows temperature control. Also, Official Notice is taken that heat sinks and temperature controllers in thermal communication with



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optical device is well known in order cool or heat optical elements for control or stability and it would have been obvious to one of ordinary skill in the art to use a temperature controller with any element that generates heat such as the laser or computer to cool the laser or computer.

With regards to **claims 50-55, 57, and 58**, one of ordinary skill in the art would have optimized for the proper working range of knowing the relationship of the fringe spacing to the wavelength, pathlength difference, point source distance, and the distance to the observation plane as is known by the teaching of Young (Young disclosed by Applicant's disclosure).

With regards to **claim 56**, Lam shows a fiber optic arrangement having in Figure 4, and it would have been well known to also use an arrangement of using a fiber optic beamsplitter.

#### ***Allowable Subject Matter***

**Claims 20-23, 59, and 60** are allowed for reasons stated in the Office Action of 3/1/06

#### ***Response to Arguments***

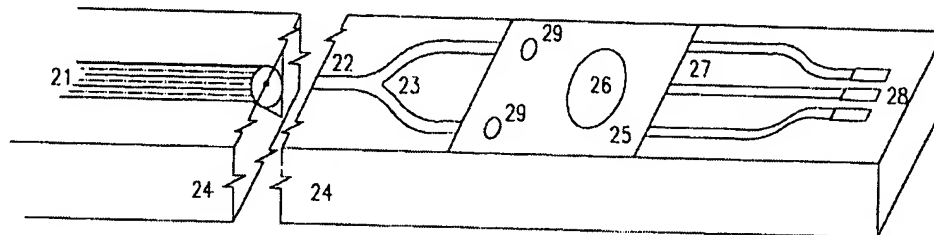
7. Applicant's arguments with respect to claims 1-19 and 24-58 have been considered but are moot in view of the new ground(s) of rejection.

#### ***Conclusion***

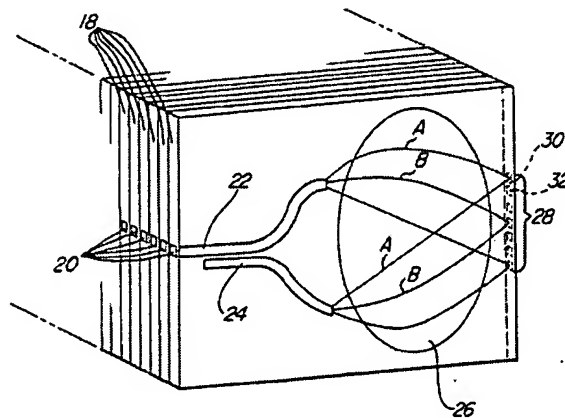
8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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9. Krivoshlykov (US 6,016,197), cited in the previous Office Action, shows a spectrum analyzer (wavelengths),



10. Cook (US4,779,984), cited in the previous Office Action, shows a spectrometer (wavelengths).



11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO**

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MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Hwa S. Lee whose telephone number is 571-272-2419. The examiner can normally be reached on Tue-Fr.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley Jr. can be reached on 571-272-2800 ext 77. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Andrew Hwa Lee  
Primary Examiner  
Art Unit 2877